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TRAINING FOR PERFORMANCE:

The Structured Training Approach

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FOREWORD

Over the past decade, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has conducted a broad series of research and development efforts on the design, development, and delivery of structured training. These efforts have yielded not only an array of training programs for the combined arms forces, but also a body of knowledge on what structured training is and how it should be produced and used.

This report offers a view of ARI's vision of training for performance by means of structure. It includes a clear definition and descriptions of numerous examples of the structured training approach, succinct overviews of procedures for development and implementation, a summary of the evidence for acceptability and effectiveness of the programs, and discussion of the utility of structured training programs within training strategies, sustainment efforts, and experimentation for the force of the future. The report also summarizes the lessons learned during ARI's research and development initiatives, and recommendations for future research and development.

Structured training is not the only answer to meeting the challenges for readiness, but it is an important component in the solution set. The advances in capabilities for both offense and defense and enhanced communications and sensor systems that promise information dominance will provide the means to protect our soldiers and intensify their value. Structured, task-focused training will then be the means to ensure that the tools are effective in the hands of the users. ARI's contributions to structured training research and development are benefiting developers, training managers, and the end-users – Army commanders and their soldiers.

EDGAR M. JOHNSON
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The Challenge for Unit Readiness

Battalion Commander LTC Ramirez is confronting a challenge that, with some variations, is being played out in US Army units worldwide. The battalion came back from deployment in May, just over a month ago, at peak proficiency for the deployment mission – stability operations. Their mission-essential task list (METL) is good – LTC Ramirez just finished reviewing it to make sure it supports the brigade's primary mission of defense in a major theater of war. He knows, however, that the battalion had little time to concentrate on the METL tasks during the deployment. Now they are preparing to regain their METL proficiency with extensive training at all echelons, culminating in February with an exercise at the National Training Center (NTC) – the battalion's first NTC rotation in over two years.

The training will be a challenge. LTC Ramirez has had the command for only four weeks and his S3, MAJ Posnik, arrived just two weeks ago. During the summer, they will have almost 40% turnover in NCOs and 50% turnover in officers. Worse yet, the unit's operational tempo (OPTEMPO) is down to 13 miles a month on track vehicles.

LTC Ramirez knows the challenge. He and MAJ Posnik have talked it through, and they're both committed to intense training during the next seven months to get ready. They will focus on the tasks in their METL, practicing until they have the proficiency to really benefit from the high-intensity NTC training experience. They've listed the battalion training needs – a long list – and at the bottom of the list, LTC Ramirez has written and underlined "Structured Training!"

Both LTC Ramirez and MAJ Posnik are staunch believers in the training cycle in FM 25-100 and battle-focused training. They know that they need both drills and lanes, for all echelons, and for small teams and the full group. They just don't have the funds to go to the field, or the time to both construct the training and conduct the training. They have the full support of the Battle Simulation Center (BSC), and LTC Ramirez wants to use it to the max - he knows it's his best chance to get some realistic training time for the leaders and the troops. Using simulation, he will be able to have his Capstone exercise and the battalion will have the chance for the needed drills and lanes training, to reinforce their strengths and remediate any weaknesses. When they're done, they will be ready to take on the NTC challenge, and will have the unit cohesion, confidence, and skills to meet their goals.

TRAIN-UP FOR NTC - WHAT DO WE NEED?

- ✔ Platoons and companies- Maneuver tasks-separately and then together- **DRILLS, THEN LANES.**
- ✔ Battalion staff members- Individual instruction and practice on the tasks in planning and preparation, as well as the mission execution tasks- **COMPUTER-BASED.**
- ✔ Battalion staff members- practice together, both within and across staff sections, so that they can work together as teams within the larger battalion staff team-**VIGNETTES.**
- ✔ Battalion staff member- large groups, integrate more and more of the tasks required of the battalion.
- ✔ "Capstone" exercise-full staff and sections-integrate the mission planning, preparation, and execution tasks for the platoons, companies, battalion assets, and staff. Bn Cdr in training, not the director.

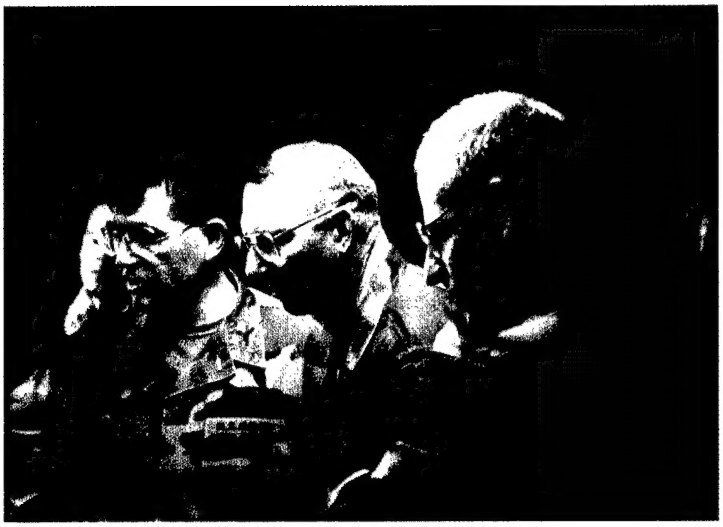
STRUCTURED TRAINING!!!

LTC Ramirez and MAJ Posnik both know that it's possible to get that kind of task-focused exercise, by means of structured training. LTC Ramirez saw a demonstration of structured training at the last Armor Conference, and MAJ Posnik participated in structured simulation-based exercises during his Armor advanced course. With the structured training programs on the shelves and in the computers at the BSC, they won't have to spend three hours preparing materials for one hour of training. Instead, the battalion members can focus on getting themselves ready to participate. Two years ago, it wouldn't have been an option; today, it is.

When they visit the BSC, LTC Ramirez and MAJ Posnik tell the site manager what they want: structured training, individual through multiechelon, focused on their METL. For the Capstone exercise, they want tough conditions - a "run" level exercise - but for the exercises leading up to the Capstone, they will need some "crawl" and "walk" training. They want help from the site staff so that LTC Ramirez and MAJ Posnik can participate in the training rather than being the exercise directors. Additionally, the battalion members should spend the training preparation time in refamiliarizing themselves with their tasks, not in constructing scenarios and exercises.

The BSC site manager understands the need and the plan, and confirms what LTC Ramirez and MAJ Posnik expected. In the BSC learning center, there are individual computer-based instruction modules for the battalion staff members. There are training materials for a variety of "live simulation" exercises for small staff groups on specific staff tasks, and there are simulation-based exercises for all echelons and for multiechelon training.

With the BSC's automated exercise planner, LTC Ramirez and MAJ Posnik can call up simulation-based exercises that support their METL. They spend a little time plugging in their unit names and the conditions to represent different difficulty levels. Then they're ready to print out brigade orders, graphics, and a complete list of references for doctrine and tactics, techniques, and procedures (TTP) for their METL. The BSC site manager downloads the corresponding information for his staff: specifications for how the simulation should be set up and guides for the opposing force (OPFOR) controllers, brigade response cell, and after action review (AAR) sessions.



LTC Ramirez, MAJ Posnik, and other members of the battalion will work through their individual training modules at the BSC, and access the on-line participant guides from PCs at their desks to prepare for the simulation-based exercises. Their preparation will not involve writing brigade orders, deciding on start locations or enemy capabilities, or preparing brigade

graphics. Instead, they can spend their training preparation time in pre-training study and rehearsal on critical tasks.

LTC Ramirez thinks about his time as assistant battalion S3, the training they could do then and the training the battalion can start on today. What a difference! Seven months is starting to look OK...

Meeting the Challenge with Training

Principles of Battle-Focused Training:

- ✓ Train as a Combined Arms & Services Team
- ✓ Train as You Fight
- ✓ Use Appropriate Doctrine
- ✓ Use Performance-Oriented Training
- ✓ Train to Challenge
- ✓ Train to Sustain Proficiency
- ✓ Train Using Multiechelon Techniques
- ✓ Train to Maintain
- ✓ Make Commanders the Primary Trainers

LTC Ramirez's challenge is not unusual, and meeting the challenge with training is not a future scenario - it is how planning and preparing for training can be done now in Army units around the world. The deliberate focus on training objectives is possible because of the structured training approach: cues and conditions are designed and presented so the battalion can train on their critical tasks, training support materials are ready to use, and the training will center on task-focused feedback.

The structured training approach allows developers and users to incorporate the principles of battle-focused training and implement FM 25-100, with help from two other domains. From the human learning research domain comes instructional principles and learning theories that guide the framework of the training: a focus on criterion performance, realistic scenarios, a building block progression from simpler tasks and conditions to more complex tasks and demanding conditions, and frequent task-focused feedback. From the technology domain, a wide range of training media is accessible, including simulations, Internet-based applications, and embedded training devices.

Over the past decade, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has invested time and effort in systematic research on structured training. This report presents a comprehensive summary of ARI's experience with structured training. It zeroes in on four main topics: definitions and examples, processes for development and implementation and challenges associated with the processes, evidence of its effectiveness, and how it can be used. It also addresses the implications of the accumulated experience for future work.

Overview of the Structured Training Report

- *Definition and examples*
- *Development and implementation processes and challenges*
- *Evidence of effectiveness*
- *Place in the overall training need for teams and individuals.*
- *Key lessons learned concerning development and implementation*
- *Imperatives for additional research and development*

Structured Training Defined

> *The [structured training approach] is characterized by its emphasis on deliberate purposeful building of training that takes advantage of simulation capabilities. The exercises provide for a focus on critical tasks in a planned sequence of performance that reinforces learning and builds on prior experience. The training is embedded in the context of tactically realistic scenarios, causing the unit to be immersed in the tactical situation.*

What is structured training? In one of the earliest of the ARI structured training development projects, centered on simulation-based training for combat arms platoons and companies, a definition of structured simulation-based training was presented.[a] That definition, shown in the inset (left) guided most of ARI's early developmental work.

Over the next few years, as structured training exercises were developed for a variety of environments and users, the definition continued to evolve. The early emphasis on the use of simulation was limited to virtual and constructive simulations;[b] today it has come to include also live simulation, and thus in effect includes any training setting. As the logo of the Simulation, Training and Instrumentation Command (STRICOM) says, "All but war is simulation."

Structured training programs or exercises have five distinctive characteristics: an explicit task focus, a realistic scenario, focused task performance feedback, a training support package (TSP) to assist preparation and ensure standardization, and a linkage to a larger training strategy or family of programs. These characteristics are described briefly in Figure 1. It should be noted that the operational definition shown in Figure 1 is also likely to change as we learn more about training effectiveness and efficiencies.

Examples of Structured Training

Structured training is being used in many ways, for different levels and organizations, different tasks, and different audience mixes. It has also served as the foundation for research on the use of new simulations or operational systems. Some of those programs are described below.

Virtual Training Program (VTP) - Originally designed for Reserve Component training, the VTP comprises a series of constructive and virtual simulation-based maneuver exercises for platoons, companies, and battalions. It addresses execution only (i.e., it does not address planning and preparation), and incorporates a crawl-walk-run progression. The VTP uses Janus and Simulation Networking (SIMNET) to present highly realistic conditions. It was introduced during 1993-1994 as one of the first structured training programs developed by ARI. The VTP was also one of the earliest examples of the type of TSP that is now mandated by the US Army Training and Doctrine Command (TRADOC).

Structured Training for Units in the Close Combat Tactical Trainer (STRUCCTT) - This series of execution-only exercises is an adaptation and expansion of the VTP for use in the Close Combat Tactical Trainer (CCTT). The CCTT offers increased system fidelity and capabilities that permits participation by fire supporters, engineers, and other individuals not included in the VTP training

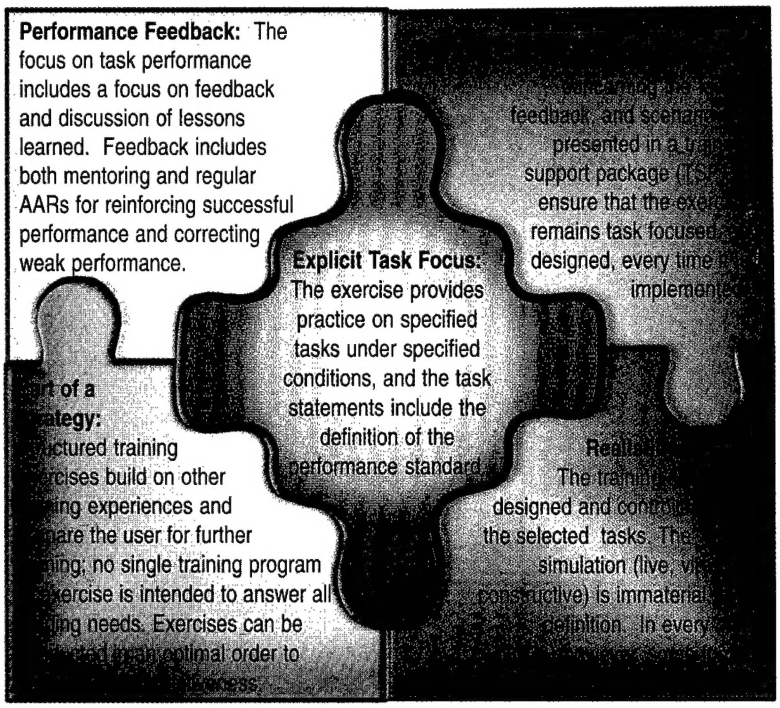


Figure 1.
Five characteristics that define "structured training"

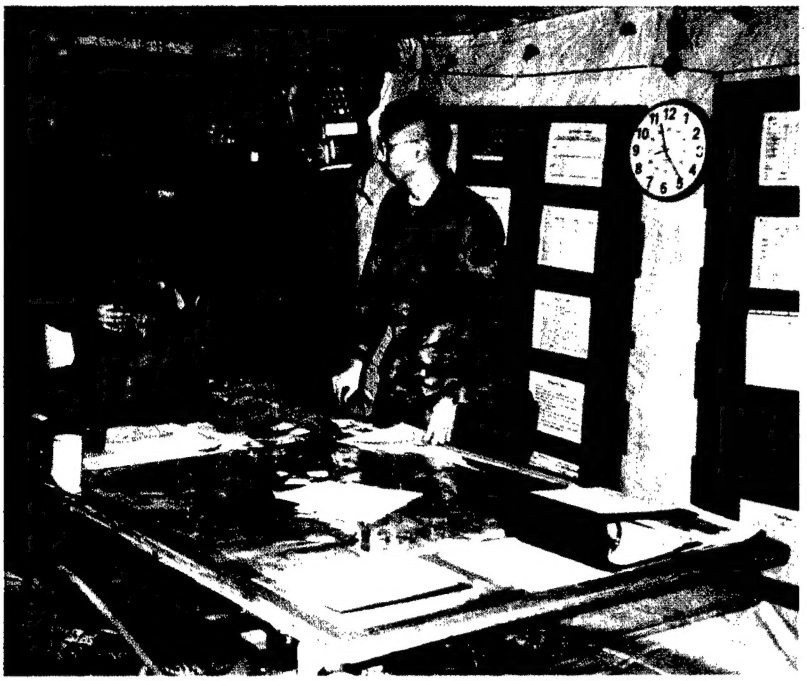
audience. The STRUCCTT work presented an opportunity to expand the training audience in virtual simulation to include combat support and combat service support personnel and dismounted soldiers. The challenge for developers was to incorporate these individuals and their tasks throughout the analysis, design, and development processes.

Staff Group Trainer (SGT) - The SGT exercises are virtual simulation-based communications exercises for battalion and brigade staff members. These exercises are among the most highly structured of the exercises developed by ARI. Human interactions are simulated by means of prepared message traffic and sent digitally to staff members. The tasks for the staff include deciding how to handle the information as well as determining what the aggregate of the information means in terms of enemy activity or battlefield conditions. The feedback mechanism is built into the software that creates the exercise conditions, so the linkage between tasks and performance is always explicit.

Staff Group Exercises (SGEs) - The SGEs, often referred to as staff vignettes, are a series of 24 small group training exercises. Each vignette supports training on specific tasks by small clusters of brigade staff members. Most of the exercises do not require any virtual or constructive simulation, but rather can be conducted in a classroom or similar setting. Each SGE is a "slice" out of the events of the large-scale brigade exercises described next.

Brigade Staff Exercise (BSE) and Brigade-Battalion Staff Exercise (BBSE) - Both the BSE and the BBSE are constructive simulation-based exercises. The BSE focuses on the brigade commander and his primary staff, while the BBSE is a multiechelon exercise for the brigade commander, staff, and sections, as well as the battalion commanders, staffs, and staff sections. These were the first of the ARI structured exercises to include planning and preparation tasks as well as execution tasks in the training objectives. The staff tasks were identified by means of intense analysis of staff processes and interactions, and incorporate "living" tasks - those performed by proficient staffs but not documented in field manuals (FMs) or TTPs. The BSE and the BBSE share a battlefield scenario that is very similar to the scenario used in the VTP, which allows units to move easily from their platoon and company training to their battalion and brigade training.

Brigade Synthetic Theater of War (STOW) Exercise - The training exercise created for use in a STOW environment had two purposes: To provide multiechelon



training for a Reserve Component brigade, and to support an experimental trial of STOW technologies. The exercise implementation incorporated live, virtual, and constructive simulations, linked by means of Distributed Interactive Simulation (DIS) technologies. The structured training TSP focused on tasks that were critical for unit training and that also permitted an assessment of some of the newer elements of the technology.

Digital Command, Control, Communications, Computers, and Intelligence (DC4I) - The DC4I training itself was secondary to the experiment that it supported. The experiment, conducted at the Mounted Maneuver Battlespace Laboratory at Fort Knox, explored the effects of future weapon systems and digital communications on staff operations and decision making processes. The training was conducted to bring the participating staff quickly to a minimal level of proficiency on the new digital equipment and tasks and allow them to think through the relationship between their normal staff processes and what they could do with the new capabilities.

Developing and Implementing Structured Training

Structuring the training occurs only with planning and focused effort. It is definitely not "business as usual." Over the years, as developers and users learned more about what structured training does and does not mean, the model for developing and implementing the exercises has expanded. This section discusses three topics concerning developing and implementing structured training:

- How it is developed
- How it is implemented
- Challenges in development and implementation.

The Design and Development Model

When the VTP was under development, the team working on the project had already spent many years using the Instructional Systems Development (ISD) model for designing and developing training programs (portrayed in Figure 2).

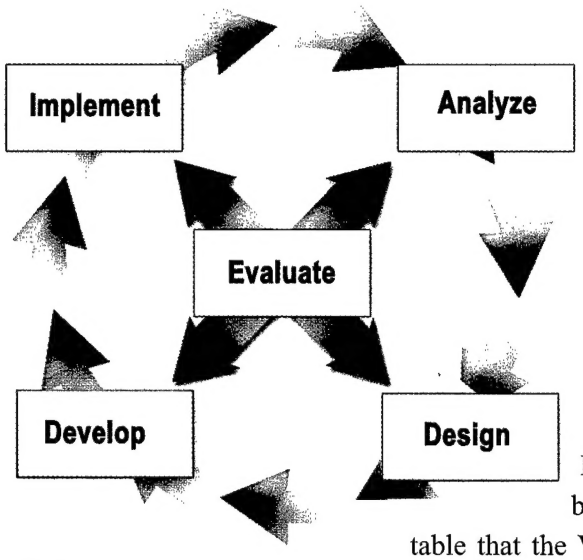


Figure 2.
The Instructional Systems Design (ISD) model for training development

That model, also appearing for military training development as the Systems Approach to Training (SAT)[c], is a cyclical process, where analysis of the training need leads to identification of the training objectives and an overall design. The training is then developed in the form of training materials or guides or texts, and is finally implemented. Evaluation is a continuing process, where all design and development decisions and products are subject to review and revision.

For the VTP development team, the basic ISD approach had become the foundation of all training development. It was inevitable that the VTP development followed that ISD/SAT approach. The key features of the model - the centrality of the training objectives throughout the development process and the importance of evaluation - were never compromised.

Because it is a widely generalizable method, however, the ISD/SAT model does not contain specific guidance on several issues. For example, it does not address the unique difficulties of constructing collective training, how and when to use simulation, or the construction of training support packages - topics that were pivotal for structured training developers.

In order to allow the development process and lessons learned to be more easily applied in additional structured training work, ARI produced a procedural model for development of structured training (portrayed in Figure 3). Based on the experience gained in the VTP development, it contained the essential steps as well as detailed discussions of variations and other considerations that might require additional decisions.

Phase 1 of the process is to clarify all of the assumptions, constraints, and expectations for the training that is to be developed. The training program's purpose, training audience, and simulation type should be specified before moving to design.

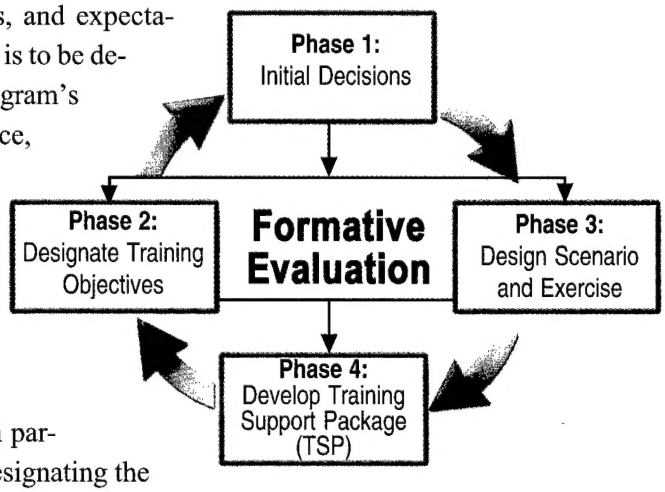


Figure 3.
ARI structured training development process

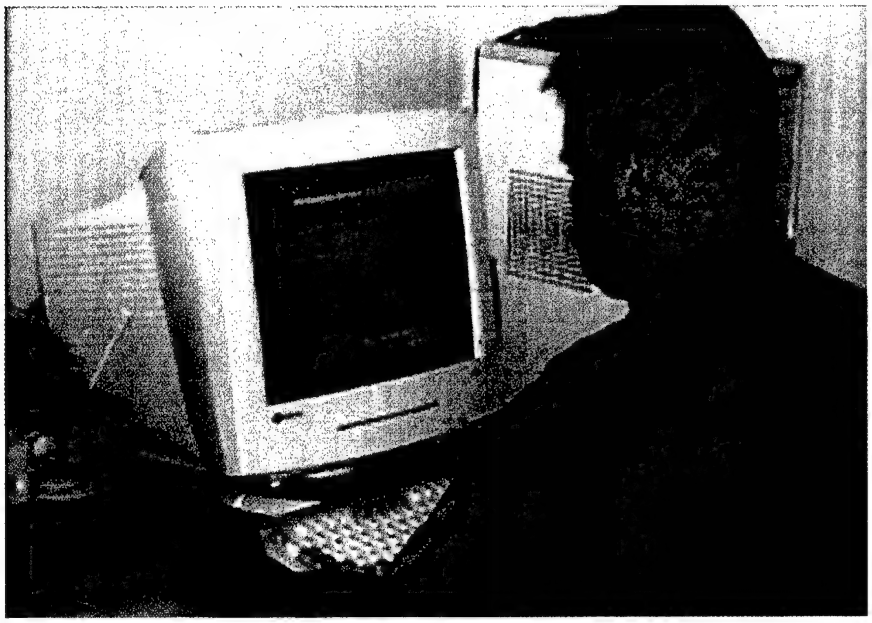
Design then encompasses two phases that are usually performed in parallel. Phase 2 requires designating the specific training objectives that both satisfy the purpose of the training and can be performed with the selected simulation. If there is a conflict between the choice of simula-

tion and any training objectives, it must be resolved early in the development process. Phase 3 involves the design of the tactical scenario and preparation of an exercise outline. Decisions made in Phase 1 and Phase 2 will be used to guide the Phase 3 work; if conflicts are discovered (e.g., the simulation cannot adequately present the desired scenario events to cue the performance objectives), resolution is again required. Finally, in Phase 4, the training materials are prepared in the form of a TSP.

Underlying every phase of design and development is the need for ongoing formative evaluation (that is, evaluation of the training program components and their utility, leading to revisions). Different methods are involved at different points in the process; they include technical reviews of products, simulation-based trials, and pilot implementations with representative users.

The Distributed Development Model - Until recently, the design and development of structured training and the associated TSPs relied almost entirely on the efforts of subject matter experts and instructional designers, with the help of only a single technology: word processing. The concept of shareable components was very primitive, consisting almost entirely of developers "reusing" existing text files and revising them to fit the new training requirement. As database technologies have become more sophisticated and able to handle larger and more complex data elements, ARI is moving to take advantage of their capabilities.

One such effort is the Commander's Integrated Training Tool (CITT), now in its third year of development.[d] The CITT is an automated system for the CCTT that assists unit trainers or other developers in downloading existing TSPs (such as those described above) to be used as they are, modifying existing TSPs in order to focus on selected tasks or to change some of the scenario conditions, and developing new TSPs from a starting point of task selection. The CITT prototype is being tested in two modes: PC-based (standalone) and Internet-based. It is designed to be linked to another database application known as the Automated Systems Approach to Training (ASAT), which catalogs all of the Army's doctrinal tasks for individuals and units.



Technologies are allowing distributed development to occur on a broader scope as well. Training development that was formerly done by a core group of schoolhouse-based developers is now being distributed: Different aspects of development are undertaken at different locations, and expert review, coordination, and integration take place by means of e-mail, teleconference, or Internet-based databases. This brings with it concerns about quality control and standardization, but opens new vistas for collaborative efforts at every phase of the process.

In 1998, ARI and the TRADOC Deputy Chief of Staff for Training (DCST) conducted a study on the integration of training development among TRADOC schools and distributed training environments.[e] One of the areas for study concerned the Warrior-T Office at Fort Hood, Texas. The Warrior-T program was established by the TRADOC DCST to perform a variety of functions related to doctrine and training for digital systems. Warrior-T Office staff not only capture lessons learned and provide feedback to TRADOC and other agencies, but also augment training development at Fort Hood. The approach is resource-intensive and is not seen as a viable long-term solution for meeting distributed training development requirements. However, it does provide an interim solution to some of the current training challenges, and the lessons learned will be critical in charting a more permanent course of action.

Implementing Structured Training

An essential aspect of structured training addresses how the training is conveyed to the user for implementation. The term "training support package" is used to describe all of the materials that ensure that the training can be implemented as designed, and encompasses multiple guides and job aids for participants and trainers, as well as a whole range of stimulus materials.

The current TRADOC definition of a collective TSP in Regulation 350-70 is: "A complete, stand alone, exportable training package integrating training products and materials needed to train one or more critical collective tasks and supporting critical individual tasks (including leader and battle staff). It is a task-based information package that provides a structured situational training scenario for live, virtual, or constructive unit or institutional training."[f]

TRADOC Collective TSP

- TSP overview
- Scenario materials
- Trainer/evaluator materials
- Training unit materials
- OPFOR materials
- References and glossary

This definition is deliberately presented at a macro-level, so as to be unrestrictive with respect to existing TSPs. The Regulation makes clear that TSPs will vary greatly in content depending on the tasks to be trained, training environment, audience, and available simulation technologies. Contents can range from a paper-based set of lesson plans used to execute classroom instruction to the myriad of orders, overlays, observer and OPFOR guidance, unit preparation materials and specification of training objectives, and simulation-based scenario files required to support a complex exercise.

As the Army continues to leverage technologies in data-basing and creating shareable training components, the TSP model (referred to as the Warfighter TSP) is becoming more definitive and comprehensive - currently the list of TSP components exceeds a full page. Not all components are required for every collective TSP; the list serves as an all-inclusive model for developers, compelling them to think about all possible components.

The ARI structured training described earlier conforms to the 6-part TRADOC TSP model. And, as TRADOC predicted in the Regulation, every TSP has been slightly different, in order to represent the particular framework of training audience, simulation, and support personnel. Nonetheless, the goal for TSPs is common for all of the programs: to provide all of the information and materials to enable the commander to conduct the needed training with minimal unit preparation time and optimal training time.

Challenges in Design and Implementation

With all its strong points, there are challenges for developers and users of structured training programs. Seven of those challenges are discussed here.

Exportability: Getting the TSP to the User - One challenge concerns the means and methods for making TSP usage as simple and feasible as possible. During the VTP and CCTT training development efforts, the emphasis was on "turn-key" training: exercises in which a unit participated with little preparation or setup work. Those efforts reduced greatly the amount of development and preparation work required of the unit, primarily because of the efficiency and effectiveness of the TSP. As with all exercises, however, some unit preparation, in the form of review of the training objectives, was essential to a successful training experience.

Unit commanders accepted the fact that some participant preparation was required in order for the exercise to be a good use of their time. Soon thereafter, the term "exportable" entered the lexicon as the goal for the TSP implementation. An exportable TSP would be boxed up and shipped to the user location; trainers or simulation site managers would then distribute all of the materials appropriately, run the exercise, and provide the feedback - with no person-to-person contact with the developers.

In a 1998 ARI project on the feasibility of unit implementation of structured training, there were intense efforts on ARI's side to reduce all barriers to implementation.[g] Nonetheless, user units consistently asked for assistance, valued the assistance, and found the exercises to be a worthwhile use of training time and effort. Simulation site personnel, too, took full advantage of the assistance available to them on the details of the structured programs they were being asked to host.

The researchers concluded that completely exportable packages were likely to be viable only in cases where no virtual or constructive simulation is used. They recommended four initiatives for providing support without standing up permanent teams at every training site: a systematic education effort for leaders, the use of "surge" teams for first-time users, Internet-mediated assistance, and access to a help line for users.

Personnel Support: Staffing the Exercises - A second challenge in implementing structured training concerns the levels of personnel support required. In virtual simulation exercises, personnel are needed to control the simulated OPFOR, adjacent units, and higher echelons which are the source of directives to the unit in training. In constructive simulations, even more simulation operators are needed, as well as personnel to represent the roles of adjacent units and both higher and lower echelons.

The personnel loads can be extensive. However, those additional personnel are more than mere training aids. Many of them (usually referred to as roleplayers) are participating in the exercise in the role or a role similar to the one that they normally fill in the "real world" - fire support NCO, assistant S2, and so on. They are receiving valuable experience and are interacting with their section leaders in ways that contribute to team proficiency.

Other support personnel serve as observers who facilitate feedback sessions. They also report positively on the benefits that they derive from their participation.[h] The personnel burden is not purely a function of structured training - it is necessitated by the use of virtual or constructive simulation. The structured training offered in the SGEs that use only live simulation requires no observers, controllers, or roleplayers external to the training audience members.

As scientists in modeling and simulation make advances in being able to automate some of the human elements in constructive simulations, roleplayer requirements may become even less extensive. For example, the SGT, described earlier, uses prepared message traffic rather than real staff members communicating digitally or by radio. The personnel load for roleplayer participants is reduced accordingly, although the current technology does not allow for a very interactive representation. The use of "simulated humans" in various positions should also allow exercises to be more flexible in terms

Comments from Roleplayers and Observers on Benefits of Participation

Gained insight into the commander's thought process

Got to practice orders process and planning and preparation

Worked on staff integration during execution

Received cross training in other areas, interfaced with other staff members

Had to track CSS requirements and operations

Develop a deeper understanding of the task requirements as a result of having to mentor the training audience members on those tasks.

of designating the primary training audience: one will be able to select which individuals to include as live participants and which to have represented by simulation technologies.

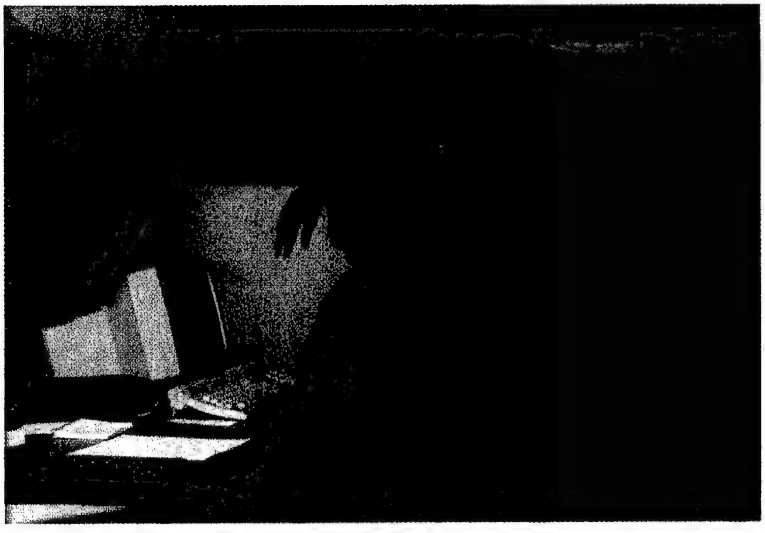
Simulation: Representing the Real World - The appropriate use of simulation to enhance training is a third challenge. Simulation, in any of its three modes (live, virtual, or constructive) is an important component in structured training. It is the means for creating the realistic conditions essential to task performance and the acquisition of skill proficiency. In many cases, the simulation of choice should be live simulation. Turning to high-tech virtual or constructive simulations, and bearing the increased burdens of personnel support needed, is not always necessary.

Use Constructive or Virtual Simulation *IF:*

- Scenario conditions that provide cues to drive performance are dynamic, ***AND***
- Performance must be seen to have an effect on those conditions.

For example, virtual simulations exist for dismounted infantry, but the squad will not use the simulation to learn hand-and-arm signals when they can as easily (and more cheaply, and as effectively) learn the same things on the parade field or parking lot. As another example, consider the need to allow a staff to prepare a targeting plan. The task is performed in the command post. There are activities ongoing outside the command post, but following that activity is not essential to the staff performing the targeting planning process. As a result, the exercise does not need to have an electronic simulation up and running in order for targeting planning to go on.[i]

The electronic simulations - virtual and constructive - are important adjuncts in certain training situations. For example, if the staff must react to logistics conditions or intelligence information by directing activities in response, and if the directed activities should cause changes that provide further information to the staff, then a constructive simulation is probably suitable to present the conditions and the changes. Or if a maneuver unit is to move on terrain, encounter enemy units, engage or hide from those units, and see the effect of its actions on the enemy and on the overall mission success, then a virtual simulation is ideal for showing the activity and outcomes.



Flexibility: Tailoring TSPs for the User - Another challenge concerns modifying TSPs for particular training needs. Early development of the VTP found developers exerting strict control over events, including activities of the enemy forces and their timing and location, communications from the higher command level, and responses from those higher levels to the unit in training. Only in this way, it was thought, would it be possible to ensure that tasks would be cued.

In later work on staff exercises, developers realized that they could not dictate a strict unfolding of events, without the staff actions being allowed to influence the occurrence or non-occurrence of events. At the same time, they realized that it was not necessary for tasks to occur at a particular point in time. For most staff actions, the task is necessarily performed at some point, and the cues were allowed to happen "naturally" - according to when they normally happen, given the staff planning and preparation steps. Thus the early notion of rigid scenario story lines gave way to more flexible and realistic scenarios, bounded by detailed rules of engagement but responsive to other things that were happening in the exercise.

Structured training programs and TSPs can offer considerable flexibility on a number of aspects. At the simplest level, users will usually want to use their own unit designations and communications protocols when implementing the programs. With preparation and attention to detail, this is viable; the procedures for effecting the changes are now written into TSPs.

At other times, users may want to expand or reduce the primary training audience. This change is usually fairly simple, requiring designation of additional roleplayers to cover some positions, or expansion of observation and feedback points to address the new training audience members and their responsibilities. When training audience members are added, however, users must also ensure that the scenario conditions are adequate to provide meaningful performance opportunities for those new participants, and if cuing conditions are added to the scenario, they must look at the whole scenario and at how the realism is affected. When the training audience is reduced, users must consider whether any key performance requirements are now rendered moot, if some of the required performers are not present.

Sometimes users will want to modify the friendly organization and capabilities, terrain placement for missions, or enemy activity. This type of change can be fairly tricky on two counts. First, such changes cascade throughout tactical materials and prepared scenario directives, and making all of the changes requires a considerable understanding of the TSP and attention to detail. Second, the changes may affect the cuing of selected performances related to the training objectives. Users must be willing to spend the time thinking through the effects of the changes on the intended purpose of the training.

"The flexible approach of tailoring the training emphasis through selection of performance objectives was what we needed."

Bde Cdr on use of BBSE

The most critical need for close examination of effects comes when the user begins to alter the training objectives. A focus on just a few of the designated objectives is a viable approach; this is, in fact, the basis for training in the BBSE, where commanders are instructed to select for their focus no more than five of the 15 training objectives that the exercise incorporates. When users want to add training objectives, however, alterations may be required in the training audience, the scenario conditions, and/or the observation and feed-

back materials in the TSP. Tools such as the CITT (described earlier) will enable users to make changes more accurately in the future.

Distributed Development: Leveraging Distance Technologies - As described earlier, distributed development of training is becoming more common. This is in part because the expertise on new systems and organizations resides as much in the users themselves as within the proponent agencies. As a result, the flow of expert information moves from the field to the schoolhouse, rather than the reverse. Because these developments are relatively recent, their impact on the quality of the TSP (positive or not) is not yet apparent. Distributed development may be one way of overcoming the dispersal of subject matter expertise. The challenge to designers and developers is in using the technologies efficiently, to support development and not simply to showcase the technologies.

Two current ARI initiatives are addressing some of the obstacles to distributed development of training. One, described earlier, is the CITT development and user testing. The CITT will put TSP access and training development tools in the hands of unit trainers.

The other is closely related, and is investigating methods of managing and assessing unit-produced TSPs.[j] This effort addresses quality control for TSPs that are not being produced by trained developers. When all components are developed in one place by a team dedicated to such development, it is relatively easy to review decisions and products, align components, and construct a complete and coherent product. A centralized authority for review and decisions will satisfy the need for quality control, but might also seriously delay the training development for users, which distributed development is intended to alleviate. Thus a method for expediting the process and proceduralizing the review is necessary.

Maintaining Currency in a Changing World - Not so many years ago, during development of criterion tests for Army jobs, developers bemoaned the fact that the jobs had changed during the nine years of the project, making it difficult to construct measures that were valid over the lifespan of the effort. Now tasks, organizations, and equipment are changing almost on a daily basis. Staying current is becoming more difficult all the time.

It is our great good fortune that units are generally able to cope with slight vagaries in doctrinal currency. This is due in part, regrettably, to the fact that they too find it nearly impossible to keep up. Thus some efforts to ensure currency will likely confuse more users than are helped. The 1998 ARI research on implementation of structured training found that users are not bothered by minor discrepancies, such as the types of graphics symbols or the names of logistics units, unless they are being asked specifically to review and find ways to improve training materials.[k] When their examination of the TSP is purely from the view of the user, they are aware of the errors (or lack of currency), but

> *"The [training] products must be updated as needed, so they are usable to a unit."*
>
> *Bde Cdr, following BBSE implementation*

generally make mental adjustments and go on. As long as the training objectives are valid and doctrinally correct, lapses in terminology are not permitted to interfere with training.

Nonetheless, every aspect of the military world is changing. In 1998, ARI presented a plan for fielding TSPs and maintaining currency. Even though that plan presented a streamlined approach to ensure quick turnaround, the process was still labor-intensive, depending on the efforts of subject matter experts to review TSP materials and identify the need for changes, make the changes (observing the cautions discussed in conjunction with the flexibility challenge), and release the improved TSP as a complete replacement for the existing version.

Other approaches are being explored, most involving a modular-based conceptualization of the TSP. Different types of changes in Army doctrine would cause different actions to be appropriate. For example, a change to naming conventions or graphics symbols could go out as a change notice; the user unit and the simulation center personnel could decide whether or not to implement the change, since the quality of the training would not be affected. For TSPs that are resident in an accessible database (such as ASAT or the Reimer Digital Library), the modifications can be made remotely and users can be notified of the upgrade.

Through the Army Training Information Systems (ATIS) reengineering, the Army is already embarked on a mission to develop and field a total Army training system that best enables the soldiers, leaders, and organizations to employ the Army's full capabilities. The objective system will "...provide integrated and distributed training information and training management support; comprehensive, configurable, content-rich training products and media; integrated synthetic training tools and devices; and reengineered training processes all in an open system capable of continuous improvement through the infusion of emerging technologies and functional requirements."[1]

Technology that can be used to store, customize, upgrade, and distribute training is advancing rapidly. Already, spurred by the ATIS initiatives, developers are exploring the possibilities for conducting simulation-based exercises in a distributed mode through inter- or intra-net means. Capabilities that were barely dreamed of during VTP development are now yesterday's news. The difficulty for developers and for the Army is in harnessing and exploiting the technologies rapidly enough to gain the advantage, ensuring that the technologies are accessible to potential users, and then moving on immediately to anticipate and leverage the next wave of enhancements.

Training Performance Assessments: What and How to Measure - Implicit in the concept of feedback is the need to measure. Discussions in AARs of activities and subsequent outcomes rely on observations and assessment of performance.

In some cases, our interest will be in clear, quantitative data: How long did it take to get out of the assembly area? How far apart were the tanks during the road march? Other times the questions have an element of fuzziness about them: How many of the fire missions were effective (first, define "effective")? Determining what performance to measure and how to measure it is a significant challenge for developers.

There are many data elements that can be captured in a virtual or constructive simulation-based exercise: hits, misses, kills, fratricides, miles driven, fuel consumption, and so on. To supplement these quantifiable measures, research is proceeding simultaneously along two tracks of investigation: development of additional system-generated measures, and development of observation aids for training facilitators (observers).

The ARI work on automated measures for use in structured training is in its third phase as part of the DC4I work at Fort Knox, described earlier. The missions are performed in a simulation-driven environment, and researchers are designing protocols to capture performance data. The analysis for the project includes an extensive search for combinations of simple existing data elements, already logged by the simulation system, that can be used to assess the performances that serve as training objectives.

Not all structured training uses virtual or constructive simulation, however, and human observations of performance are essential even when such simulations are used. In structured training, observers provide guidance and feedback in a fairly continual fashion, in addition to facilitating the scheduled AARs. Their direct observation of the participants performing the multiple activities required in a tank, a command post, or fire support center is critical in order for them to understand not only what happened, but also why it happened.

Different approaches for assisting observers have been developed, ranging from paper-based checklists and note-taking aids to electronic notepads with databases containing information about the different performance objectives from which the observer can produce reports. These approaches offer great promise in ensuring that observers are able to watch for particular behaviors, record what they see, and rapidly analyze the results for feedback to the participants.

Evidence of the Effectiveness of Structured Training

As defined, structured training has characteristics that should ensure its effectiveness. But what is the evidence? Are there data that show that structured training is effective in increasing proficiency, and that the increased proficiency also is apparent in real-world performance?

To assess training effectiveness, developers attempt to measure three essential aspects:

- Do the soldiers and commanders find the training acceptable? Do they see the relevance and appropriateness of the training? Are they able to implement the training?
- Given that the soldiers were able to implement and fully participate in the training, does the training improve performance on the training objectives? At the end of the exercise, are they more proficient at performing those things than they were when they started?
- Given that soldiers acquired proficiency during the training, does the training proficiency transfer to real world situations? Are trained individuals and teams better able to perform in real situations than untrained individuals and teams?

The ARI development efforts have all had an evaluation phase including a trial implementation with Army units. These evaluations yielded valuable information about acceptability, learning, and transfer.[m] Across the many implementations of structured training, the findings are strong and consistently positive for acceptability and achievement of the training objectives, and at least suggestive for transfer to on-the-job performance.

Repeatedly, survey data showed that participants saw improvement in their skills throughout the exercises. They commented on specific tasks on which they improved, and also mentioned improvements in more intangible aspects of their jobs, such as teamwork and communications. The progression from less to more complex conditions helped them to

Participant Comments

"I got more out of the [VTP] than I did in my past two visits to SIMNET."

Soldier, following VTP platoon exercise

"The AARs helped us focus on how to improve...[they] created an environment that encouraged participation, questions, and learning from mistakes."

Battalion Commander, following VTP battalion exercise

"We need more TSPs like [BSE]. It allowed me to maximize my training time with my staff with very little overhead. If I had run and resourced a [simulation-based exercise], the cost would be prohibitive and the results not as good."

Brigade Commander, during the BSE

"Performance objectives allow commanders to lay the groundwork for a shared vision for tactical operations and commander's intent."

Brigade Commander, during BBSE

develop their task skills, as did the progression from small group exercises to integrated multiechelon exercises. The fact that they could participate without having to build the exercises themselves was seen as a clear advantage.

In 1998, ARI embarked on an ambitious training assessment project with two purposes: to examine the feasibility of unit implementation of structured training programs, and to assess the value of the training programs in terms of performance improvement. The project was initiated because of findings in previous implementations that units saw implementation of the more complex exercises (e.g., BSE and BBSE) to be very difficult. During the course of the research project, intensive assistance was offered to two brigades to support implementation of both individual and collective training using ARI-developed TSPs (specifically, the SGEs, BSE, and BBSE). Unit members and trainers were interviewed and observed both during training and at a subsequent rotation to NTC.

Overall, the findings were positive, presenting an interesting mixture of support for the structured training approach and suggestions for changes and improvements.[n] Most participants felt that the SGEs had a beneficial impact on their NTC performance, and that they should be used by units to sustain proficiency and to prepare for a Combat Training Center (CTC) rotation. In fact, at the conclusion of the training rotation, the brigade commander expressed his intention of using the SGEs to sustain the skills they had acquired during their earlier training and their NTC rotation. Nearly all of the participants felt that the BBSE enabled them to practice techniques they would use in battle, and that their individual understanding and abilities had improved. All of the respondents reported that their own teamwork skills had improved as a result of the training. Responses from the BBSE observer group also indicated a perceived improvement in teamwork skills and staff proficiency.

Training researchers are still in the early stages of being able to demonstrate that structured training is effective in improving battlefield performance or affecting outcomes. Most of the evidence is compelling, especially when the results from many implementations and data collections are viewed together. The greatest challenge is still in the area of training transfer: the extent to which skills learned in training are also used on the job. Because of the great challenge in controlling for or accounting for extraneous conditions (e.g., personnel turbulence, amount of training time and funds), and because of the immensity of the performance effectiveness criterion definition, there is a long way to go in showing the effectiveness of any training approach, including structured training.

Structured Training in the Big Picture

Structured training is not a panacea. It is one of many tools available to trainers and training developers who are addressing the total training need - it is not the only tool. However, the characteristics of structured training ensure its applicability across a wide spectrum of training. In this section, the discussion addresses:

- Role of structured training in the training progression
- Potential uses for structured training approaches.

Considering the full scope of training that should be provided to individuals and teams, structured training has a position in the middle of that scope, after initial introduction of concepts and terms, and prior to high intensity skill refinement exercises such as the CTCs offer. As will be discussed below, it is a very large niche, primarily because of the flexibility that structured training provides and the generality of the definition.

Structured Training in the Training Progression

There are a number of ways to think about the overall progression of training, all of which are considerations in designing a training strategy. Some of those dimensions include:

- Echelon progression: Training for sections and platoons, companies and teams, battalions and squadrons, brigades, and so on. The progression provides for linkages among tasks and missions at the different echelons, so that training objectives and contexts at each echelon are integral to the training objectives and contexts in subsequent multiechelon exercises. Without implying full and identical matching of scenarios or tasks, this concept is sometimes referred to as "nesting" or "congruency."

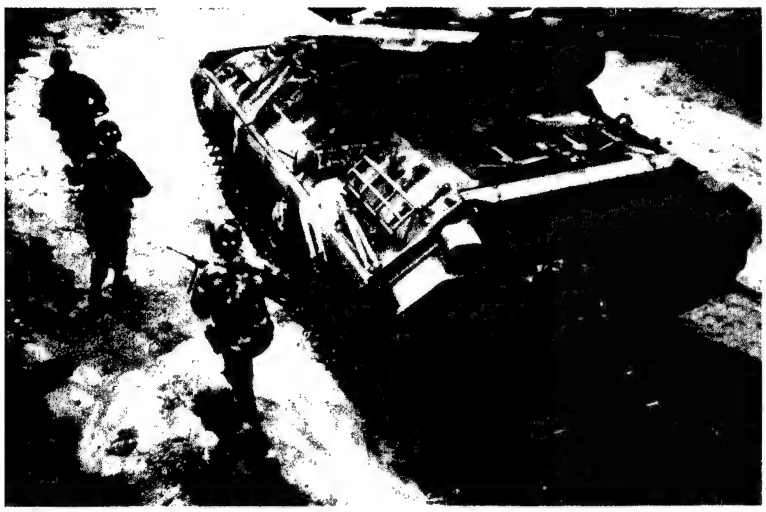
- Group size progression: Individual training linked to small group/ team exercises, in turn linked to exercises for full sections, staffs, or units. Again, the linkage is in terms of both training objectives and contexts.

- Task progression: Training that deliberately allows for performance in less difficult conditions or less complex tasks before progressing to more difficult conditions and more complex tasks. Such a progression makes use any of several approaches, such as crawl-walk-run, part-task to whole-task, or hierarchical sequencing. The TRADOC Digital Learning Strategy[o] falls into this type of conceptualization.

Echelon progression presents little challenge for structured training developers. The structured training approach can and has been used for echelons from squad teams to division staffs. It is in considering jointly group size and task progression that there is some reason for discussion with respect to the appropriateness of structured training.

Initial training is usually seen as targeting individuals who are learning the most basic of information - naming of parts and processes, procedural rules and steps, identification and classification of components. Rote memorization plays an important role in such training. The instruction moves very quickly to performance, but is unlikely to start with performance. The individual is not yet ready to begin performing the tasks; this level of training is the preparation for performance. By the same token, training for groups or teams also begins with basic information. The center of attention will be on learning basic facts and procedures, before introducing hands-on performance and skill acquisition.

As soon as the individual or team is ready to move on to acquiring skill and demonstrating performance, a structured training program should be the tool of choice. Structured training can be used by individuals or teams, at formative stages or at the point where they are drilling for higher levels of skill. As the individuals or teams become more proficient, they will even begin to formulate shortcuts, protocols, and operating procedures that will contribute to their efficiency and effectiveness.



There will come a point when the individual or team moves beyond structured training. They will need to test, validate, and refine their proficiency and the procedures that they as a staff or team intend to employ. For this to happen, the training situation must become much more intensive, and

the focus will not be on known tasks, but rather on discovery of strengths and remediation of weaknesses in performance. The emphasis will be on experience, and the standard for performance will be unknown: the team will be competing against itself.

Potential Applications

Structured training programs have been developed and used to support many situations and training needs. From that history of usage, a summary of the potential applications was compiled and is presented below.

Train-Up for the New Staff - Personnel turnover is a significant obstacle to readiness. Team performance depends on more than individuals knowing their own jobs: They must also understand how their teammates work, how information is shared, and what kinds of backup they can count on (or be counted on). A succession of structured training exercises that addresses individual training within the context of the team and proceeds to exercises involving some, and then all, of the team can provide the experience that they need to become more than a collection of individuals.

> *"We should have worked this out before we got to the NTC."*
>
> *Bde Cdr, during an NTC AAR*

Preparation for Combat Training Center Rotations - Simulation-based training will never completely replace field training. It will never be able to give commanders and their units the full feel of live performance, and cannot adequately represent the stresses of battle as a large scale live exercise can. But because it can portray a great deal of realism and require performances that will later be required in the field exercise, simulation-based training can help units get the most benefit from live training exercises. Simulation-based training can be seen as an essential practice opportunity in preparation for the expensive and increasingly rare CTC rotations.

Refresher Training for Deployed Units - When structured training programs for different echelons are available as off-the-shelf (or off-the-hard-drive) packages, they become easily accessible for units that are in need of retraining. The GAO pointed out in 1999 that peacekeeping missions and drug interdiction efforts that require deployments for up to 6 months are having an adverse effect on the warfighting skills of both the deployed unit and the units back home that cover for them.[p] Structured training exercises for these units can help them to quickly regain their perspective on wartime conditions and skills.

> *"Hey sir, these vignettes [SGEs] ...I can see how useful they can be to us now."*
>
> *Staff member to Bde Cdr, at end of training at the NTC*

Sustainment Training - The skills of the soldiers in both conventional and digitally-equipped units are highly perishable.[q] Structured training exercises offer units and commanders the means to incorporate targeted sustainment training in their training calendar even during the usually quiet time immediately after a CTC rotation. The training should be seen not only as a way to remediate skills that showed poorly in the CTC rotation, but also as a means for reinforc-

ing proficiencies. As noted above, the normal post-rotation turbulence can also be eased by means of small group or team exercises leading up to complex staff or multiechelon exercises.

Training and Testing - It is often the case that a training program or exercise designed to strengthen individual or team skills comes to take on the guise of a test. The original emphasis on performance, feedback, lessons learned, and continued training gives way to evaluation, pass/fail scores, and decisions about readiness. This is not altogether a bad thing, unless the training and feedback aspects are completely lost. In fact, it may be a very valuable additional use for a program. In 1999, the US Army Forces Command (FORSCOM) required unit commanders to demonstrate unit proficiency prior to participating in training center exercises and other complex training exercises. A structured training program can provide the basis for the demonstration while at the same time allowing the unit to work together on their critical tasks in preparation for the higher tempo training.

"Many units arriving at the training centers cannot take full advantage of training opportunities because they lack the requisite skills to effectively execute brigade- or battalion-level missions"

GAO Report

The US General Accounting Office (GAO) reported in 1999 that the potential benefits of rotations to the combat training centers are being lost because units are not sufficiently prepared to participate in those high intensity exercises.[r] While many factors (e.g., personnel shortages and turnover) were found to contribute to the lack of preparedness, the report concludes that home-station training and certification of readiness may be valuable in helping units take advantage of training center opportunities.

Because structured training is focused on tasks, it can provide a framework for the readiness certification requirement while also allowing the commander and staff to perform the requisite tasks and get feedback to improve performance.

Warfighting Experiments and Concept Exploration - One of the important tools for combat and force developments is modeling and simulation. While much can be explored using engineering simulations, at some point the "soldier-in-the-loop" is essential to testing the concepts formulated by the models. Somehow, however, those soldiers need to be brought to a suitable level of proficiency on the novel systems or settings that are being investigated. Structured training, developed specifically for particular experiments, can be invaluable in controlling for unfamiliarity with the innovative systems as a confounding factor.

A structured approach to constructing scenarios and feedback systems can also be the key to ensuring that the experiment purposes hold center stage. As the experimenters formulate the purposes, delineating precisely their information requirements, training developers construct programs that will ensure that the experiment findings are not confounded with skill deficiencies, but can be unequivocally tied to the controlled experimental system and conditions.

Lessons and Recommendations

The wealth of experience that has been accumulated by ARI in its development and testing of structured training has resulted in a rich collection of lessons learned. The discussion below represents a synthesis of the experiences and observations across nearly ten years of structured training research.

Education and Leader Development

> *"The emphasis to use the programs must come from the chain of command."*
>
> *DCG(M) supporting BBSE implementation*

As has been pointed out in several of the development efforts, users are much more positive about the programs after they have experienced them. Initial resistance focuses on the perceived lack of flexibility and need for resources. At the conclusion of training, users comment favorably on the amount of experience that was possible for all participants and the degree to which the training targeted their own weaknesses.

Until structured training programs and TSPs become a way of life for the Army, unfamiliarity will continue to engender reluctance to participate. By instituting, as a part of the ongoing leader development process, a continual stream of education on the uses and methods for structured training, the Army can rapidly bring such programs into common usage for units.

Leader education is required at all levels. Command endorsement and emphasis will be critical to widespread implementation. When information about structured training and existing TSPs is an integral part of leader development programs, leaders will begin to accept the structured training approach as a valuable tool that they can use. They will also have a realistic understanding of the utility and the limitations of virtual and constructive simulations. And when the whole chain of Army leadership is on record as supporting structured training, the programs will begin to appear in training strategies and long range training plans.

Use of Surge Teams

While leader education will be critical in allowing structured training to become completely institutionalized, first-time users (units and simulation center personnel) will profit from assistance. Permanent training support teams at all training locations are not required, but multifunctional "surge teams", comprising a handful of experts with a variety of training development skills, have proven their worth in numerous settings.

For example, simulation experts have assisted the simulation center personnel in understanding why the files are designed in particular ways, and what elements can or should be modified. Instructional designers show the unit trainers how the TSP is to be reproduced and distributed. Military experts are invaluable in mentoring the first-time exercise directors and observers on how to ensure that the training stays focused on the selected training objectives. A team that spends most of its time on generating TSPs for new situations and maintaining existing programs can also be tapped to assist first-time users and staff the help desk for the fielded exercises.

It should be emphasized that the purpose of surge team assistance is to begin the process of institutionalizing structured training, one site at a time. It is one component of a larger system that includes automated tools, help desks, and Internet-based exchanges of information.

Flexibility

> *"...very positive about the performance objectives and the flexible AAR approach."*
>
> *BBSE Observers*

Consistently, units have asked for modifications to structured training exercises. The requested alterations typically involve unit naming conventions, terrain areas, organizations and equipment, OPFOR characteristics, and even the type of simulation used. As ARI's research on the CITT and on management of user-produced TSPs begins to yield products for fielding, the desired flexibility will become as much a part of the TSP as are the focus on training objectives and feedback.

Performance Feedback

The focus on feedback is essential to training. Implementations of exercises at all levels have shown the value of feedback sessions that occur very soon after the relevant exercise events and focus on the tasks designated as training objectives. Feedback sessions that allow for participant-directed discussion and resolution of difficulties have been cited by users as being the key to their performance improvement.

Labor-intensive observation methods should be complemented by automated approaches and computer-based tools that turn the automated data and the observations into summary slides or discussion notes. The technology exists, and efforts to harness it are in progress.

Link to Other Initiatives

ARI's efforts in exploring the many facets of structured training are becoming more visible to other training development agencies and proponents of other initiatives. Researchers in the US Navy[s] and US Air Force[t] are performing research that complements much of what ARI has done. Between TRADOC

and FORSCOM, there is an opportunity for sharing information concerning training needs and training methods. The TSPs that are used in units can also be used in proponent schools and leader training. Additionally, TRADOC's automation efforts for job and task analysis, training management, and training strategies are continuing to gather momentum. It would be unfortunate if these diverse efforts were to proceed without information sharing that will allow each effort to leverage discoveries of the others.

Meeting the Challenge

Nine months have passed. LTC Ramirez and MAJ Posnick recognized and took advantage of opportunities for regaining their METL proficiency that allowed them to focus on the performance, and not be distracted by the mechanics of training development and implementation. Their challenges were not diminished - turbulence and minimal OPTEMPO were another fact of life. But so was training for performance. The structured training for all echelons, for individuals, small groups, and large complex groups, with a Capstone exercise to integrate the entire program of preparation served them well. Their NTC rotation was considered a success, in that they made optimal use of their time in the desert with a professional observer team, world-class OPFOR, and challenging missions and terrain. In the aftermath of the high-intensity experience, they know what their performance issues are - what to sustain and what to improve - and they know that the structured training programs will be available to them to address the issues. Those same programs and tools will help them to overcome the deleterious effects of turbulence, tackle changes to their organization and equipment, address new missions, and do it all with constrained resources.

The Army and the other services will continue to face high personnel turbulence, reduced OPTEMPO, and fast-moving changes to doctrine, organizations, and equipment. Deployments for peace-keeping and other stability and support operations will make inroads on combat readiness and strain the ability to excel.

These challenges are not going to disappear. LTC Ramirez, MAJ Posnik, and many other concerned leaders will confront conditions that could frustrate their standards for unit preparedness. Yet the Army and the nation will always demand the highest levels of performance from soldiers and their leaders.

Fortunately for leaders today, training offers opportunities for focus and realism not available to the leaders of earlier years. With its technology-rich means and media, training is also made accessible to users by the existence of al-

ready-developed programs, tools for obtaining and modifying training, and guides for developing new training programs, new applications, and new approaches for implementation.

This report offers a view of ARI's vision of training for performance by means of structure. It includes a clear definition and descriptions of numerous examples of the structured training approach, succinct overviews of procedures for development and implementation, a summary of the evidence for acceptability and effectiveness of the programs, and discussion of the utility of structured training programs within training strategies, sustainment efforts, and experimentation for the force of the future. The report also summarizes the lessons learned during ARI's research and development initiatives, and recommendations for future research and development.

Structured training is not the only answer to meeting the challenges for readiness, but it is an important component in the solution set. The advances in equipment for both offense and defense and enhanced communications and sensor systems that promise information dominance will provide the capabilities to protect our soldiers and intensify their value. Structured, task-focused training will then be the means to ensure that the tools are effective in the hands of the users.

TEXT NOTES

[a] Hoffman, Graves, Koger, Flynn, & Sever (1995).

[b] "Virtual simulation" is defined as real-time simulation, where interactions are driven by human perceptions of time and space. "Constructive simulation" is defined as aggregate level, force-on-force simulation, where interactions between entities (e.g., battalions, brigades) occur by means of statistical techniques and predetermined probabilities. "Live simulations" are exercises that are considered to be simulations because they do not involve a real enemy; real soldiers perform in real-world settings and with real or modified weapon systems.

[c] TRADOC Regulation 350-70 (1999).

[d] Gossman, Bonnett, Forrest, Shadrick, Dannemiller, Flynn, Mauzy, & Bonnett (2000).

[e] Clagg, Detrani, Burnside, & Finley (1999).

[f] TRADOC Regulation 350-70 (1999), p. V-7-4.

[g] Pratt, Graves, Campbell, Detrani, Leibrecht, Allen, Jenkins, & Quinkert, K. A. (2000).

[h] Graves, Campbell, Deter, & Quinkert, 1997.

[i] Most military theorists would say that the staff needs to be constantly aware of the developments among the maneuver units and logistics units as they are planning. However, an exercise might focus just on the targeting plan itself. In another phase in a training progression, the staff would multi-task, to maintain situational awareness at the same time. The first approach was used in the SGEs, and the BSE and BBSE then used the second. This example is also a case in point for the assertion that no one training exercise is supposed to train every task.

[j] Human Resources Research Organization, Raytheon, & Litton-PRC (2000).

[k] Pratt et al. (2000)

[l] Army Training Information Management Program (2000).

[m] For each of those efforts, a final report on the development and implementation of the particular program was generated (listed in the References), and each report presents a summary of the evaluation findings.

[n] Pratt et al. (2000).

[o] TRADOC Digital Learning Strategy (1998).

[p] GAO (1999a).

[q] Wisher, Sabol, & Ellis (1999).

[r] GAO (1999b), p. 9.

[s] Fowlkes, Dwyer, Milham, Burns, & Pierce (1999).

[t] Gentner, Tiller, Cunningham, & Bennett (1999).

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14. ABSTRACT (Maximum 200 words):

This report summarizes ARI's work in conducting research and development on structured training programs, discusses the uses for structured training, and presents an overview of the lessons learned and recommendations for future work. Structured training programs are characterized by a focus on selected tasks, emphasis on task performance feedback, realistic context involving simulation, documentation in the form of a training support package (TSP), and linkage to other training in a broader strategy for training. Eight of ARI's recently developed structured training programs are described as examples of the various ways the approach can be used. The report presents the design, development, and implementation processes, and discusses seven challenges to design and implementation (e.g., exportability, personnel support requirements, maintaining currency). Findings on the acceptability and effectiveness of structured training are summarized, along with first-hand comments from users in various settings. The report briefly describes six key opportunities for using structured training (e.g., refresher training for deployed units, preparation for Combat Training Center rotations, sustainment training). Finally, a summary of the lessons learned and recommendations is included. These focus on leader education, use of surge teams for training support, training flexibility, performance measurement and feedback, and links to other initiatives.

15. SUBJECT TERMS

Structured Training	Simulation-Based Training	Instructional Systems Development	Lessons Learned
Task-Based Training	Training Development Method	Training Effectiveness Assessment	Training Support Package

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